18. (a) Write a short note on non-metallic oxidizing agents (i) DMSO/DCC, (ii) DMSO/oxaloyl chloride, (iii) Dess-Martin reagent.

(b) What are selectrides? How are they useful in stereoselective reduction of alkenes?

19. With the support of suitable examples explore mechanism of (a) Gomberg reaction (b) Pschorr reaction, (c) Hunsdiecker reaction (d) Ulmann reaction.

20. (a) Discuss the aromatic character of bridged [10] annulenes (5)

(b) Describe the aromatic character of benzene using heat of hydrogenation and molecular orbital theory. (5)

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APRIL/MAY 2024

DCH21/GCH21 — ORGANIC CHEMISTRY - II

Time : Three hours Maximum : 75 marks

Shanmuga Industries Arts & Science College T.V.Malai

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Why carbenes are electron deficient?

2. Give an example for Micheal addition.

3. Define β -elimination with an example.

4. What is the relative reactivity of alkyl halides in E_1 elimination?

5. Predict the product, when 1-methylcyclohexene treated with (a) OsO_4, (b) BH_3

6. Give an example for using trialkyl tinhydride.

7. How does benzoyl peroxide generate free radical?

8. Write the formula of calculating ESR spectral lines.

9. Predict whether cycloheptatrienyl cation is aromatic or anti-aromatic.

10. Draw the structure of [14]-annulene and [18]-annulene.

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Discuss the regioselectivity in hydroboration of 1-methylcyclohexene.

Or

(b) Explain the insertion reaction of carbenes to cis and trans-2-butene.

12. (a) Discuss various factors affecting the proportions of elimination and substitution.

Or

(b) Explain the stereochemistry of E_2 elimination reaction in cyclohexane.

13. (a) Explain the oxidation of allylic alcohols with plausible mechanism using suitable examples.

Or

(b) Enumerate the synthetic applications of sodium borohydride and hydrazine.

14. (a) Explain with plausible mechanism of addition of free radical to alkene.

Or

(b) ESR technique is a useful tool in the detection of free radicals. Justify the statement with suitable example.

15. (a) Distinguish aromatic compound from anti-aromatic and non-aromatic compound using suitable examples.

Or

(b) Explain the aromatic and non-aromatic character of [10]-annulenes.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. With the support of example, write the plausible mechanism

(a) Simon-Smith reaction (3)

(b) Benzoin condensation (3)

(c) Mannich reaction (4)

17. (a) Why do erythro and threo isomer of 2,3-dibromopentane give different alkene when treating with base?

(b) Discuss the mechanism of E1CB elimination reaction with examples.